Materials Science Division

TIP FABRICATION FOR THE SCANNING TUNNELING MICROSCOPE

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The STM allows imaging of a material surface structure through a tunneling current that is created between the conductive sample and a sharp, conductive tip. Having a sharp tip is essential for taking accurate STM images. My part in this project will be to fabricate the tips that will be using for the STM; however it is my goal to improve upon this process by consistently making sharp, well-shaped tips. I will be able to do this by taking the existing set-up design and then reducing the time it takes for the circuit to cut off when the wire breaks, making it as short a time as possible and leaving the sharpest tips possible. To do this, I built a circuit that will serve as a new power supply that will allow the power to cut-off within nanoseconds of tip detachment. I originally began this project by building and wiring the circuit by hand, but after much difficultly I designed a computer generated outline of the circuit and sent it to have a board made with the wires applied directly onto the board. By doing this, I was able to attach the necessary components to the circuit with minimal excess wiring.